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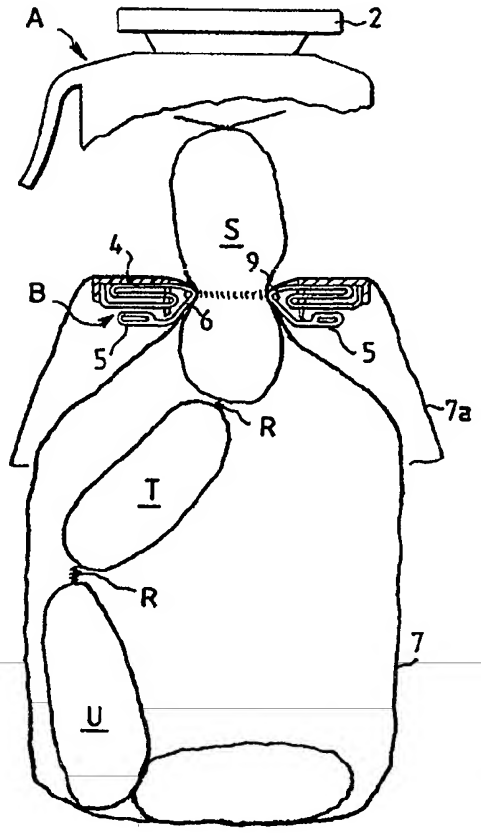
(54) Title: APPARATUS FOR PACKAGING PACKS OF ODOROUS WASTE IN FLEXIBLE TUBING

(57) Abstract

An apparatus for packaging a series of potentially odorous objects in individual packages along a length of flexible material from which odour can escape after a delay by osmotic action laterally through said tubing. Each package S, T, U, when formed, is automatically arrested by a clamping unit B to enable the tubing leading to the package to be twisted to close that package prior to being thrust further to enable a following package to be so arrested. A collector bag (7) is provided to receive each package whereby all packages in a length thereof can be removed in the bag when sealed, the bag being made of material inhibiting any osmotic action causing odour to escape from the bag.



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APPARATUS FOR PACKAGING PACKS OF ODOROUS WASTE IN FLEXIBLE TUBING

Field of the Invention

This invention relates to apparatus for packaging packs of odorous waste in flexible tubing, the packs comprising respectively of a series of potentially odorous objects along a length of such flexible tubing.

The invention is particularly applicable to the ready disposal of personal waste material such as babies' nappies, or other sanitary towels and particularly incontinent pads for elderly persons.

Description of the Prior Art

In patent specification No. GB 2206094 there is described apparatus for packaging a series of objects respectively in individual packages distributed along an unbroken length of flexible, substantially non-resilient tubing providing the walls of the packages, the apparatus comprising tubular guide means arranged to receive a pack of said flexible tubing when formed into a gathered tube and to enable one end of the tubing in the gathered pack to be drawn away from the gathered pack and passed over the end of the tubular guide means when the latter is surrounded by the gathered pack and then coaxially downwards through the tubular guide means so that the outer surface of the flexible material in the pack becomes the cylindrical inner surface of the flexible material passing through the tubular guide means, the end of the flexible tubing being initially open until sealed to form the base of a first package having the flexible tubing as its side wall, the apparatus being arranged for the base to be thrust along the tubular guide means by an object to be packaged, while further flexible tubing is as a consequence drawn from the pack over the end of the tubular guide means into the tubular guide means to envelop the object to be packaged when located at least partly in the tubular guide means, means beyond the tubular guide means being provided for manually twisting the flexible tubing beyond an object when so located to close and thereby complete a package comprising that object and so provide the base for a further package for a further object to be thrust into the tubular guide means, whereby objects can be packaged in series along the length of unbroken tubing and at least an element being arranged to co-operate with each object to be packaged to hold the enveloping tubing against axial rotation during the said twisting.

The objects referred to above may be single objects or discrete collections of items, dry, damp or very wet and in the case of incontinent pads may be immediately odorous or, in the case of babies nappies' odorous through the tubing wall only after a period of, for example, eight hours. A very convenient substance for the material of which the tubing is made is high density polyethylene and the odour, often delayed, becomes apparent through the wall as a result of osmotic action by diffusion of a liquid or gas through the semi-permeable wall of the flexible tubing. Such a result of osmosis can be avoided by the use of different material for the tubing, such as laminated material by which the osmotic action can be inhibited when the different materials for the two laminae are appropriately chosen. However such other materials have been found to lack the best mechanical properties required and to be uneconomical.

When polyethylene or equivalent tubing as aforesaid is used for a series of packages, say eighteen, collected over a period of time in a closed bin prior to or after being severed from the remainder of the gathered pack thereof, an accumulated odour builds up in the bin particularly in the case when the series of packages is so long that it has to be severed as a unit to be removed from the bin. A certain amount of odour can also sometimes escape during the normal use of the apparatus through the opening at which the objects to be packaged are inserted.

Summary of the Invention

In certain cases where the apparatus is used individually or in a hospital or nursing home the build up of an unpleasantly odorous ambiance can be distressing and it is an object of the present invention to provide means whereby this condition can be avoided.

According to the present invention, apparatus for packaging a series of potentially odorous objects respectively in individual packages distributed along an unbroken length of flexible substantially non-resilient tubing being withdrawn from a gathered pack of said tubing to provide the walls of the packages, comprises a guide cylinder open at an inlet end for the successive entry thereinto of the objects to be packaged while the wall of the tubing passes over an entry rim at said end, the arrangement being such that manual pressure exerted through said rim as by the action of an object to be packaged when pressed into said guide cylinder causes said tubing to pass over said rim and along said guide cylinder while more tubing is drawn from said pack, the

apparatus being further provided with clamping mechanism for engaging each package prior to passing said mechanism to hold it against rotation when the tubing is twisted between the package and said entry end completely to close the package by the actuation of twisting means provided for that purpose, and a flexible collection bag detachably mounted with its open end positioned to receive each package after passing said mechanism, said bag being arranged to be removed in a condition completely enclosing the packages contained therein and being made of material inhibiting any escape of odour due to osmotic action into the ambient atmosphere.

Brief Description of the Drawings

In order that the invention may be clearly understood and readily carried into effect forms of apparatus in accordance therewith will now be described with reference to the accompanying drawings, in which:

Figures 1, 2 and 3 are diagrams showing one form of the apparatus respectively in three phases of its operation;

Figures 4 and 5, show a practical application of the invention respectively in two phases of its operation; and

Figures 6 and 7 are respectively a sectional elevation and plan of a unit for use in forms of the invention such as shown in Figures 1 to 5.

Description of Preferred Embodiments of the Invention

Referring particularly to Figures 1 and 4, the apparatus may be considered as consisting of three units A, B and C. The unit A is arranged to operate as described in detail in the aforesaid prior specification GB 2206094 for carrying an annular pack 1 of tubing and providing the ring 2 for guiding the leading end of the tubing (after sealing at the end) through a guide cylinder 3 while more tubing is thereby withdrawn from the pack, the action being caused by the successive manual thrust of the items to be packaged through the rim 2 and the tubing being manually subjected to twisting action at the rim 2 to provide a sealed closure R between each package and the next package to be formed along the series of packages S, T, U etc., this series being formed in a period of time which may vary between, for example, a few hours and some days.

The second unit B to which the first unit B is detachably latched provides clamping means for holding each package temporarily against rotation while the tubing immediately following that package is twisted finally to close the package. An example of

this second unit B is shown in Figures 6 and 7. This consists of a rigid ring 4 of plastics material within which are mounted eight radially mounted pressure spring jaws 5 equidistantly spaced from one another and each having its active end 6 projecting into the central opening in the ring 4 and each arranged to yield when the jaws are pressed radially outwards when a package S is forced and held between them as shown in Figures 1 and 4. However, as will appear below, the jaws do not make direct contact with the tubing material (polyethylene) but with the neck of a collector bag 7 in which the tubing of the packages lies.

The third unit C consists of a support which holds the unit B high enough for the collector bag to receive all the packages S, T, U etc. (For example eighteen of them) that it is required to hold. This support is not shown in Figures 1 to 3 but in Figures 4 and 5 is shown as a wheeled bin 8 with a side door 8a that can be opened for the removal of the filled bag 7 when required.

The bags 7 can often be bought in a flat condition (see bottom of Figure 1) but this is not essential. A new bag 7 has to be arranged so that its upper end passes through the ring 4 and above the ring is flared out over the ring as shown in Figure 6 with a depending skirt 7a. It is then clamped in position when the unit A is fixed on the unit B, by any conveniently activated mechanical device. As the apparatus is used the bag is opened out as shown in Figures 2 and 3 by the gradually accumulating packages. The bag 7 must be made of a material that cannot allow any escape of odour to the outside by osmosis. A laminate of two different co-extrusion materials (such as saran and polyolefin or PVDC) can be effective.

When the bag 7 with its contents has to be removed it is of course necessary to sever the tubing containing the packages between the annular pack 1 and guide cylinder 3 in unit A. This can be done by the use of the cutter device described in the aforesaid specification GB 2206094 or by a cutter device that can be brought into relationship with the rotatable rim 2. However, in order to avoid all possible escape of odour, this should be done when the final package S is still held tightly by the jaws 5 (see particularly Figures 3, 5 and 7). To augment this sealing action it is advantageous to provide an elastic band 9 at the throat of the clamping jaw mechanism for increasing the pressure of the neck of the bag on the outside surface of the package tubing. Various types of elastic band are possible such as round or flat section bands or even a steel spring tension seal. After the

package tubing has been cut, the skirt portion 7a of the collector bag 7, as shown in Figures 2 and 3 is raised and tied into a knot 10 so that the bag 7 then provides a complete cover for all the packages and can be removed with all the packages when the final package S has been pushed clear of the unit B.

It will be noted that, from Figure 7, the elastic ring 9 closes the gaps between the active ends 6 of the jaws 5 so that there can be no odour leakage between adjacent pairs of the active ends 6 of the jaws 5. Thus, there can be no leakage between the inner surface of the neck of the bag and the flexible length of tubing defining the discarded packages. Each package on being held by the clamping mechanism acts as a plug preventing the escape of odour gradually building up in the collector bag with time. Any odour escaping from the final package to be enclosed by the knot 10 in the bag neck is retained when the knot is formed.

CLAIMS:

1. Apparatus for packaging a series of potentially odorous objects respectively in individual packages distributed along an unbroken length of flexible substantially non-resilient tubing being withdrawn from a gathered back of such tubing to provide the walls of the packages, the apparatus comprising a guide cylinder open at an inlet end for the successive entry thereinto of the object to be packaged while the wall of the tubing passes over an entry rim at said end, the arrangement being such that manual pressure exerted through said rim as by the action of an object to be packaged when pressed into said guide cylinder causes said tubing to pass over said rim and along said guide cylinder while more tubing is drawn from said pack, the apparatus being further provided with clamping mechanism for engaging each package prior to passing said mechanism to hold it against rotation when the tubing is twisted between the package and said entry end completely to close the package by the actuation of twisting means provided for that purpose, and a flexible collection bag detachably mounted with its open end positioned to receive each package after passing said mechanism, said bag being arranged to be removed in a condition completely enclosing the packages contained therein and being made of material inhibiting any escape of odour due to osmotic action into the ambient atmosphere.

2. Apparatus according to Claim 1, in which said clamping mechanism comprises a support unit formed with an aperture through which each package is delivered axially from said guide cylinder while fixed in said flexible tubing through a neck of said collector bag into said bag, the mechanism further comprising radial jaws reciprocally mounted and spring urged to engage said bag neck with a package therein when thrust axially to a position within said aperture to be arrested by jaw pressure on said neck until thrust axially away from that position.

3. Apparatus according to Claim 2, in which an end of said neck is folded outwards above said aperture to be clamped thereon beneath said guide cylinder with a peripheral skirt which, on the severance of a length of packages from said pack, can be folded up and tied behind the final package in the length while still gripped by said jaws whereby the bag can be removed in a closed condition with all the packages collected therein.

4. Apparatus according to Claims 2 or 3, furnished with an elastic band encircling the outside of the bag neck within the active ends of the jaws, thereby providing a complete seal around the inside of the bag neck and the tubing defining the packages and eliminating odorous leakage from within the bag through its neck.

5. Apparatus substantially as hereinbefore described with reference to the accompanying drawings.

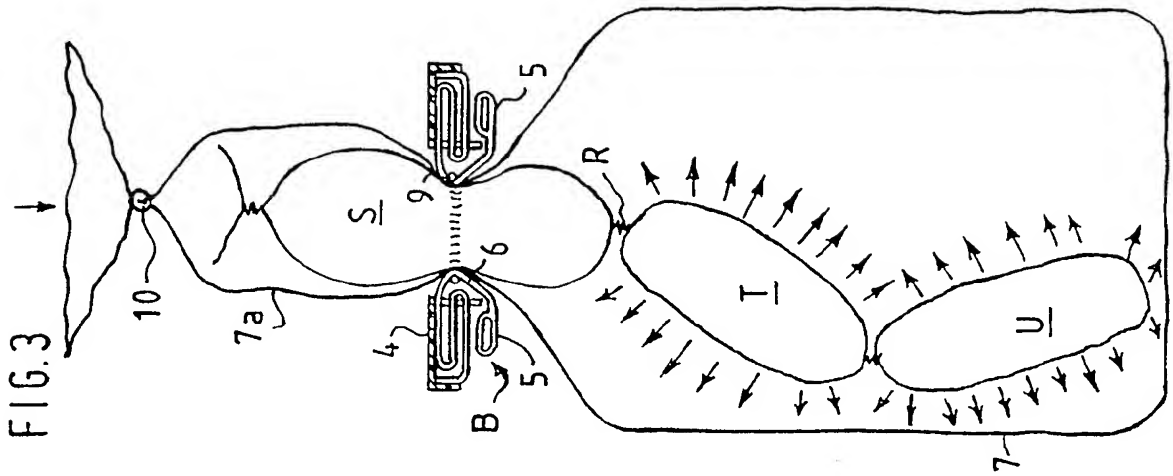


FIG.3
10
7a
S
9
6
4
5
B
5
R
T
U
7

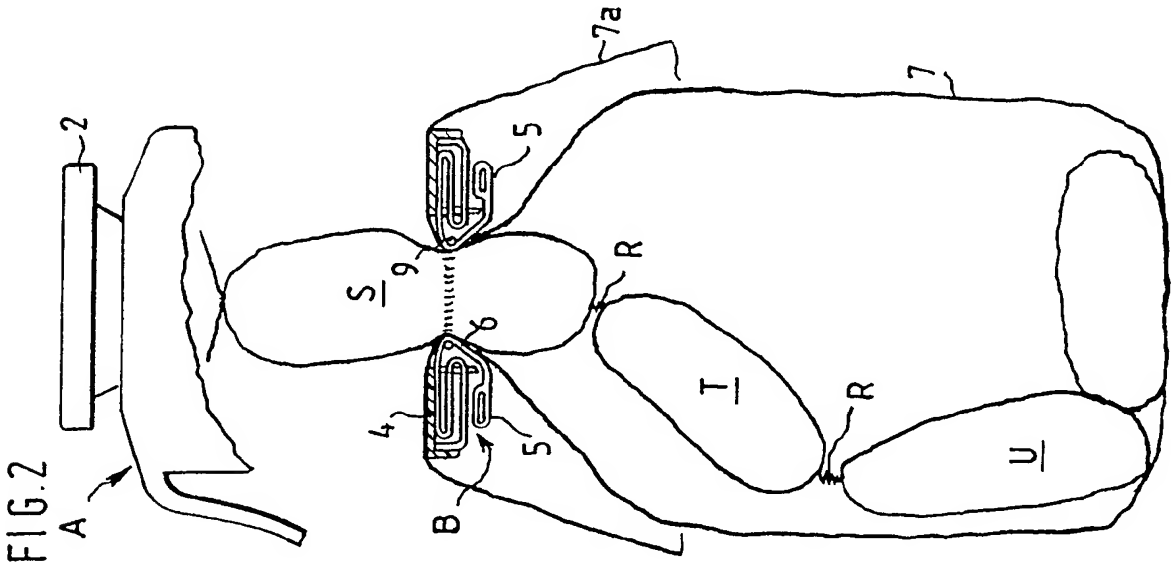


FIG.2
A
2
S
9
6
4
5
B
5
7a
7
R
T
R
U

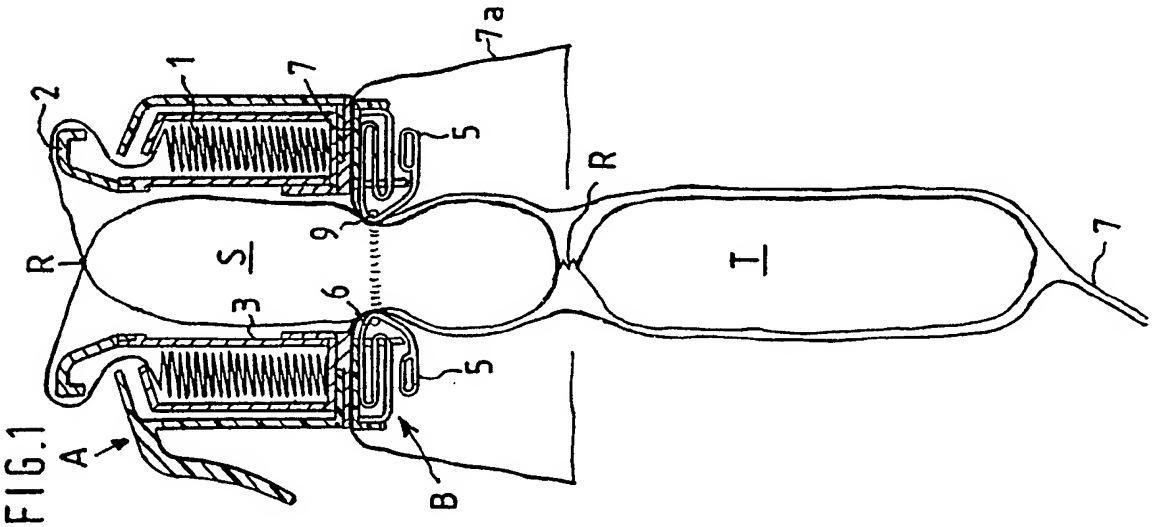


FIG.1
A
2
1
7
S
9
3
6
4
5
B
5
7a
R
T
R
7

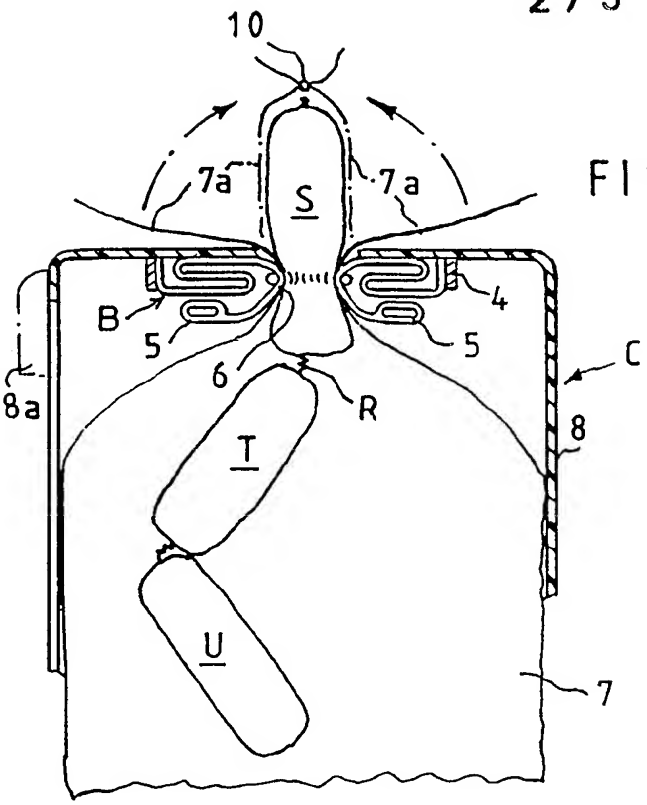


FIG.5

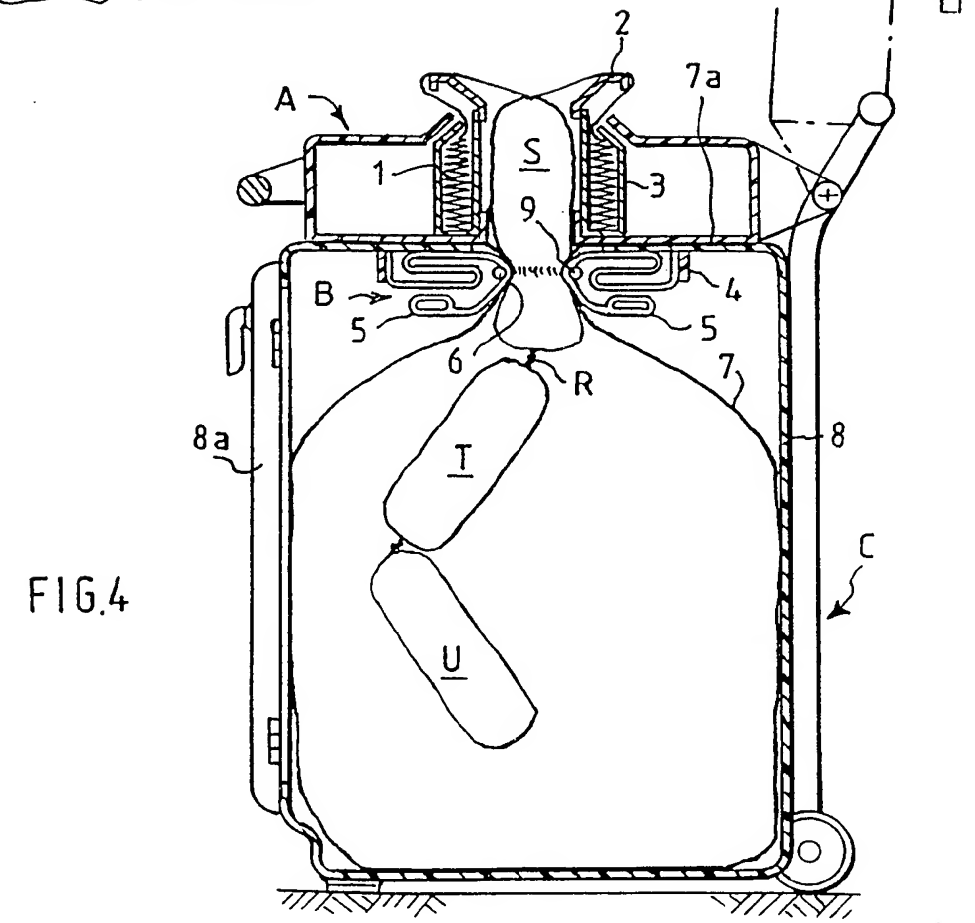


FIG.4

FIG.6

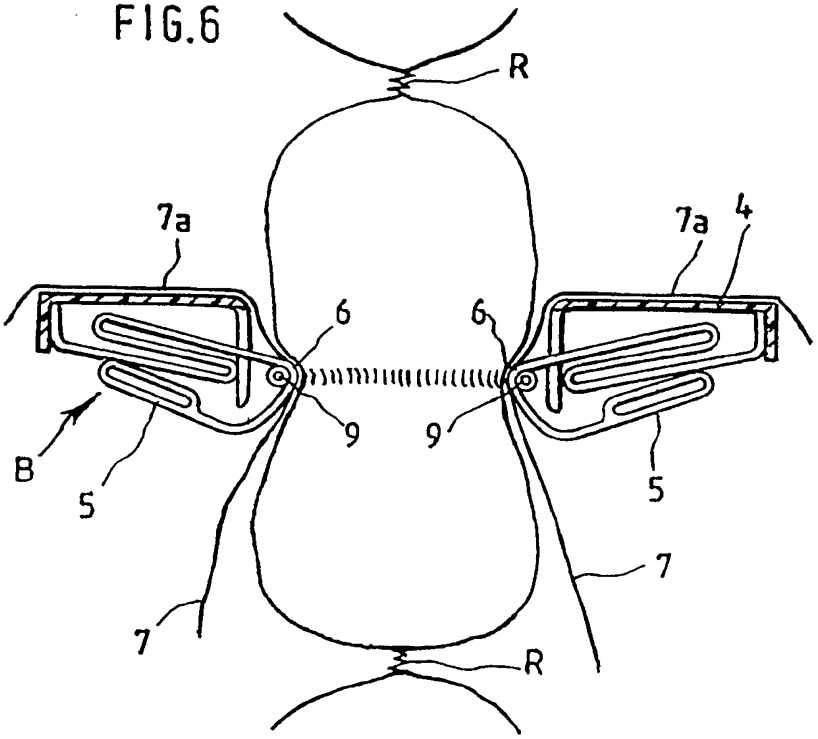
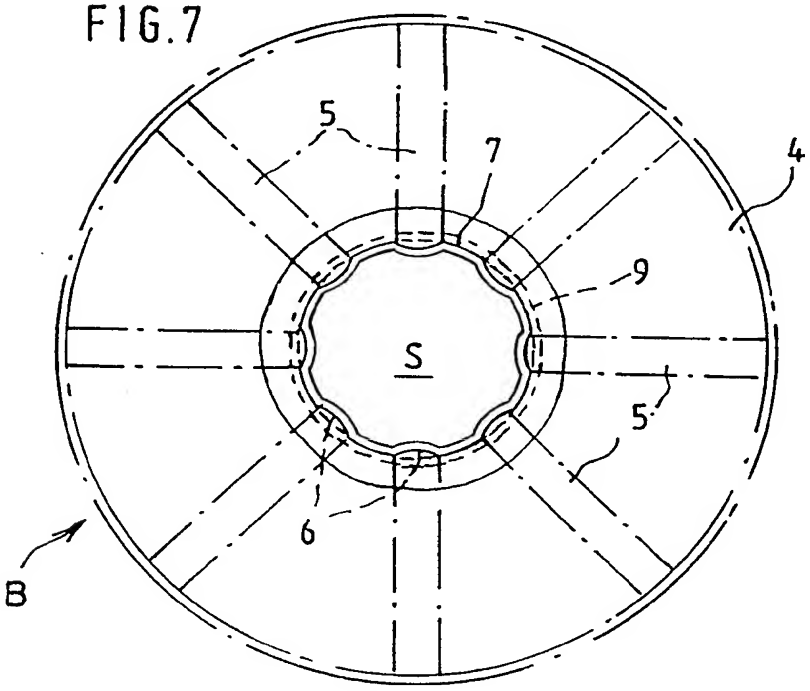


FIG.7



INTERNATIONAL SEARCH REPORT

Internat. Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B65B67/12 B65F1/06 B65B9/15

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B65B B65F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 699 584 A (PROCESS IMPROVEMENTS 1989 LTD) 6 March 1996 see column 2, line 1 - line 35; figure 1	1,2
A	EP 0 356 051 A (PROCESS IMPROVEMENTS LTD) 28 February 1990 see column 4, line 32 - line 58; figures 3-5	1-3
A	GB 1 355 611 A (MUCON ENG CO LTD) 5 June 1974 see the whole document	1
A	FR 2 725 421 A (LECOMTE MICHEL RAYMOND GEORGES) 12 April 1996 see the whole document	1

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☒ Patent family members are listed in annex.

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Information on patent family members

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